

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Original): A process for the preparation of polysiobutenylphenol-containing Mannich adducts by

a) alkylation of a phenol with highly reactive polyisobutene having a number average molecular weight of less than 1000 and a polydispersity of less than 3.0 at below about 50 °C in the presence of an alkylation catalyst;

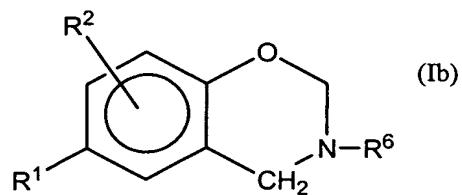
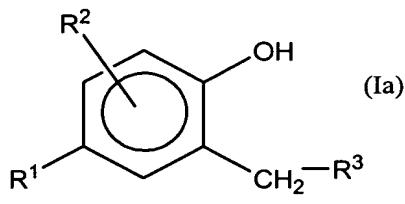
b) reaction of the reaction product from a) with

b1) an aldehyde chosen from formaldehyde, an oligomer and a polymer of formaldehyde and

b2) at least one amine which has at least one primary or at least one secondary amino function.

Claim 2 (Previously Presented) The process as claimed in claim 1, wherein the amine is 3-(dimethylamino)-n-propylamine, di[3-(dimethylamino)-n-propyl]amine, dimethylamine, diethylamine or morpholine.

Claim 3 (Previously Presented) The process as claimed in claim 1, wherein an adduct mixture is obtained which comprises at least 40 mol% of compounds of the formula Ia and/or Ib,

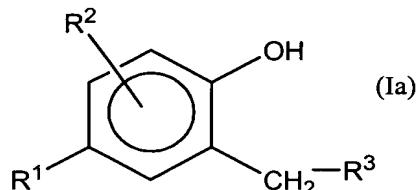


where

R¹ is a terminally bonded polyisobut enyl radical,

R² is H, C₁- to C₂₀-alkyl, C₁- to C₂₀-alkoxy, hydroxyl, a polyalkylenyl radical or CH₂NR⁴R⁵, where R⁴ and R⁵ have the meanings stated below, and

R³ is NR⁴R⁵, where R⁴ and R⁵, independently of one another, are selected from the group consisting of H, C₁- to C₂₀-alkyl, C₃- to C₈-cycloalkyl and C₁- to C₂₀-alkoxy radicals which may be interrupted and/or substituted by N and O heteroatoms, and phenol radicals of the formula II



where R¹ and R² are as defined above;

with the proviso that R⁴ and R⁵ are not simultaneously H or phenol radicals of the formula II; or R⁴ and R⁵, together with the N atom to which they are bonded, form a 5-, 6- or 7-membered cyclic structure which has one or two heteroatoms selected from N and O and may be substituted by one, two or three C₁- to C₆-alkyl radicals; and

R⁶ is a radical R⁴ or R⁵ other than H.

Claim 4 (Previously Presented) The process as claimed in claim 1, wherein an adduct having a polydispersity of from 1.1 to 3.5 is obtained.

Claim 5 (Previously Presented) The process as claimed in claim 1, wherein R¹ has a number average molecular weight of from 300 to 850.

Claim 6 (Previously Presented) The process as claimed in claim 1, wherein the reaction mixture from b) is fractionated by column chromatography over an acidic stationary phase by multistage elution with

- at least one hydrocarbon and then
- at least one basic alcohol/water mixture.

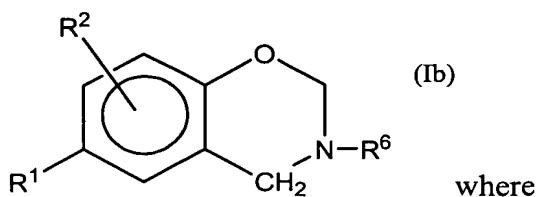
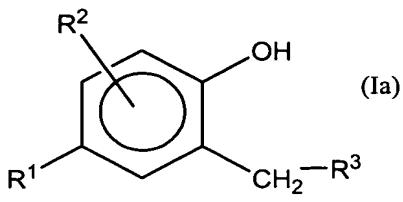
Claim 7 (Previously Presented) The process as claimed in claim 6, wherein the basic alcohol/water mixture is a mixture of

- a) from 75 to 99.5% by weight of at least one C₂- to C₄-alcohol,
- b) from 0.4 to 24.4% by weight of water, and
- c) from 0.1 to 15% by weight of at least one amine which is volatile at room temperature.

Claim 8 (Previously Presented) The process as claimed in claim 1, wherein the adduct mixture obtained includes from 0 to 20 mol% of polyisobutlenylphenols from reaction step a) which have not been further reacted.

Claim 9 (Previously Presented) A Mannich adduct obtained by the process as claimed in claim 1.

Claim 10 (Previously Presented) A Mannich adduct comprising at least one compound of the formula Ia and/or Ib,

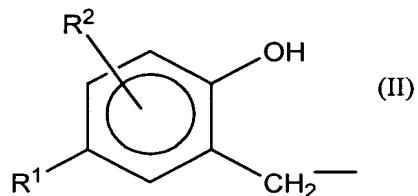


where

R¹ is a terminally bonded polyisobut enyl radical,

R² is H, C₁- to C₂₀-alkyl, C₁- to C₂₀-alkoxy, hydroxyl, a polyalkylenyl radical or CH₂NR⁴R⁵, where R⁴ and R⁵ have the meanings stated below, and

R³ is NR⁴R⁵, where R⁴ and R⁵, independently of one another, are selected from the group consisting of H, C₁- to C₂₀-alkyl, C₃- to C₈-cycloalkyl and C₁- to C₂₀-alkoxy radicals which may be interrupted and/or substituted by N and O heteroatoms, and phenol radicals of the formula II



where R¹ and R² are as defined above;
with the proviso that R⁴ and R⁵ are not simultaneously H or phenol radicals of the formula II; or R⁴ and R⁵, together with the N atom to which they are bonded, form a 5-, 6- or 7-membered cyclic structure which has one or two N and O heteroatoms and may be substituted by one, two or three C₁- to C₆-alkyl radicals; and

R⁶ is a radical R⁴ or R⁵ other than H.

Claim 11 (Canceled).

Claim 12 (Previously Presented): An additive concentrate containing, in addition to conventional additive components, at least one Mannich adduct as claimed in claim 9 in amounts of from 0.1 to 99.9% by weight.

Claim 13 (Previously Presented): A fuel composition containing a main amount of a liquid hydrocarbon fuel and an amount, having detergent activity, of at least one adduct as claimed in claim 9.

Claim 14 (Previously Presented): A lubricant composition containing a main amount of a liquid, semisolid or solid lubricant and an amount, having detergent activity, of at least one adduct as claimed in claim 9.

Claim 15 (Canceled).

Claim 16 (Previously Presented): An additive concentrate containing, in addition to conventional additive components, at least one Mannich adduct as claimed in claim 10 in amounts of from 0.1 to 99.9% by weight

Claim 17 (Previously Presented): A fuel composition containing a main amount of a liquid hydrocarbon fuel and an amount, having detergent activity, of at least one adduct as claimed in claim 10.

Claim 18 (Previously Presented): A lubricant composition containing a main amount of a liquid, semisolid or solid lubricant and an amount, having detergent activity, of at least one adduct as claimed in claim 10.

Claim 19 (Previously Presented): The process as claimed in claim 1, wherein the adduct mixture obtained includes from 1 to 15 mol% of polyisobutenyphenols from reaction step a) which have not been further reacted.

Claim 20 (Previously Presented): An additive concentrate containing, in addition to conventional additive components, at least one Mannich adduct as claimed in claim 9 in amounts of from 0.5 to 80% by weight.

Claim 21 (Previously Presented): An additive concentrate containing, in addition to conventional additive components, at least one Mannich adduct as claimed in claim 10 in amounts of from 0.5 to 80% by weight.

Claim 22 (Previously Presented): A method for preparing a detergitized fuel or lubricant composition, said process comprising adding the Mannich adduct claimed in claim 9 to a fuel or a lubricant composition.

Claim 23 (Previously Presented): A method for preparing a detergitized fuel or lubricant composition, said process comprising adding the Mannich adduct claimed in claim 10 to a fuel or a lubricant composition.

Claim 24 (Previously Presented): The process as claimed in Claim 1, wherein the highly reactive polyisobutene has a number average molecular weight of less than 900.

Claim 25 (Previously Presented): The process as claimed in Claim 1, wherein the alkylation of the phenol is carried out at below 35 °C.

Claim 26 (Previously Presented): The process as claimed in Claim 1, wherein the Mannich adduct has a polydispersity of from 1.05 to 3.5.

Claim 27 (Previously Presented): The process as claimed in Claim 1, wherein the Mannich adduct has a polydispersity of from 1.1 to 1.9.

Claim 28 (Previously Presented): A process for making a polyisobut enyl phenol-containing Mannich adduct, comprising:

alkylating a phenol with a highly reactive polyisobutene having a number average molecular weight of less than 1000 and a polydispersity of less than 3.0 at below about 50 °C in the presence of an alkylation catalyst to form a first reaction product;

reacting the first reaction product with an aldehyde selected from the group consisting of formaldehyde, an oligomer of formaldehyde and a polymer of formaldehyde, and at least one amine selected from the group consisting of an amine having at least one primary group and an amine having at least one secondary amino function, to form a second reaction product;

fractionating the second reaction product by a column chromatography over an acidic stationary phase by multistage elution with at least one hydrocarbon and then at least one basic alcohol/water mixture.

Claim 29 (Previously Presented): A process for making a polyisobut enyl phenol-containing Mannich adduct, comprising:

alkylating a phenol with a highly reactive polyisobutene having a number average molecular weight of less than 1000 and a polydispersity of less than 3.0 at below about 50 °C in the presence of an alkylation catalyst to provide a first reaction product;

reacting the first reaction product with an aldehyde selected from the group consisting of formaldehyde, an oligomer of formaldehyde, and a polymer of formaldehyde, and at least one amine selected from the group consisting of an amine having at least one primary function and an amine having at least one secondary amino function, to form a second reaction product;

fractionating the second reaction product by chromatography over an acidic stationary phase by multistage elution with at least one hydrocarbon and then at least one basic alcohol/water mixture comprising from 75 to 99% by weight of at least one C₂- to C₄-alcohol; from 0.4 to 24.4% by weight of water; and from 0.1 to 15% by weight of at least one amine which is volatile at room temperature.

Claim 30 (Previously Presented): The process as claimed in Claim 3, wherein the adduct mixture comprises a compound of formula Ia wherein R³ is N(CH₃)₂.

Claim 31 (Previously Presented): The process as claimed in Claim 3, wherein the adduct mixture comprises a compound of formula Ia wherein R³ is N(Bu)₂ and Bu are butyl groups independently selected from the group consisting of n-butyl, iso-butyl, sec-butyl, and tert-butyl.

Claim 32 (New): The process as claimed in Claim 1, wherein the phenol is at least one of an unsubstituted phenol or an alkyl substituted phenol.

Claim 33 (New): A Mannich adduct obtained by the process as claimed in Claim 32.

Claim 34 (New): The process as claimed in Claim 1, wherein the phenol is 2-methyl phenol.

Claim 35 (New): A Mannich adduct obtained by the process as claimed in Claim 34.

Claim 36 (New): The process as claimed in Claim 1, wherein the amine is at least one secondary amine of formula HNR^4R^5 , wherein R^4 and R^5 are substituents other than hydrogen.

Claim 37 (New): A Mannich adduct obtained by the process as claimed in Claim 36.

Claim 38 (New): The process as claimed in Claim 1, wherein the amine is at least one secondary amine of formula HNR^4R^5 , wherein R^4 and R^5 are independently a $\text{C}_1\text{-C}_{20}$ -alkyl radical which may be at least one of interrupted and substituted by at least one of N and O.

Claim 39 (New): A Mannich adduct obtained by the process as claimed in Claim 38.

Claim 40 (New): The process as claimed in Claim 38, wherein at least one of the R^4 and R^5 groups is a $\text{C}_1\text{-C}_{20}$ -alkyl radical that is at least one of interrupted and substituted by at least one of N and O, wherein the N and O are substituted by at least one of H, a $\text{C}_1\text{-C}_6$ -alkyl group, an aryl group and a hetaryl group.

Claim 41 (New): A Mannich adduct obtained by the process as claimed in Claim 40.

Claim 42 (New): The process as claimed in Claim 1, wherein the amine is at least one secondary amine of formula HNR^4R^5 selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine and diphenylamine.

Claim 43 (New): A Mannich adduct obtained by the process as claimed in Claim 42.

Claim 44 (New): The Mannich adduct as claimed in Claim 10, wherein R^2 is CH_3 .

Claim 45 (New): The Mannich adduct as claimed in Claim 10, wherein R^2 is $\text{CH}_2\text{NR}^4\text{R}^5$ and R^4 and R^5 are not hydrogen.

Claim 46 (New): The Mannich adduct as claimed in Claim 10, wherein R^2 is $\text{CH}_2\text{NR}^4\text{R}^5$ and R^4 and R^5 are each independently a $\text{C}_1\text{-C}_{20}$ -alkyl radical which may be at least one of interrupted and substituted by at least one of an N and a O heteroatom.

Claim 47 (New): The Mannich adduct as claimed in Claim 10, wherein R^2 is $\text{CH}_2\text{NR}^4\text{R}^5$ and R^4 and R^5 are each independently a $\text{C}_1\text{-C}_{20}$ -alkyl radical which is at least one of interrupted and substituted by at least one of N and O, and wherein the N and the O are substituted with at least one selected from the group consisting of H, $\text{C}_1\text{-C}_6$ - alkyl, an aryl group and a hetaryl group.

Claim 48 (New): The Mannich adduct as claimed in Claim 10, wherein R^2 is $\text{CH}_2\text{NR}^4\text{R}^5$ and R^4 and R^5 is at least one of a dimethylamino group, a diethylamino group, a

methylethylamino group, and di-n-propylamino group, a diisopropylamino group, a diisobutylamino group, a di-sec-butylamino group, a di-tert-butylamino group, a dipentylamino group, a dihexylamino group, a dicyclopentylamino group, a dicyclohexylamino group, and a diphenylamino group.

Claim 49 (New): The process as claimed in Claim 28, wherein the phenol is at least one of an unsubstituted phenol or an alkyl substituted phenol.

Claim 50 (New): The process as claimed in Claim 28, wherein the phenol is 2-methyl phenol.

Claim 51 (New): The process as claimed in Claim 28, wherein the amine is at least one secondary amine of formula HNR^4R^5 , wherein R^4 and R^5 are substituents other than hydrogen.

Claim 52 (New): The process as claimed in Claim 28, wherein the amine is at least one secondary amine of formula HNR^4R^5 , wherein R^4 and R^5 are independently a $\text{C}_1\text{-}\text{C}_{20}$ -alkyl radical which may be at least one of interrupted and substituted by at least one of N and O.

Claim 53 (New): The process as claimed in Claim 52, wherein at least one of the R^4 and R^5 groups is a $\text{C}_1\text{-}\text{C}_{20}$ -alkyl radical that is at least one of interrupted and substituted by at least one of N and O, wherein the N and O are substituted by at least one of H, a $\text{C}_1\text{-}\text{C}_6$ -alkyl group, an aryl group and a hetaryl group.

Claim 54 (New): The process as claimed in Claim 28, wherein the amine is at least one secondary amine of formula HNR^4R^5 selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine and diphenylamine.

Claim 55 (New): The process as claimed in Claim 29, wherein the phenol is at least one of an unsubstituted phenol or an alkyl substituted phenol.

Claim 56 (New): The process as claimed in Claim 29, wherein the phenol is 2-methyl phenol.

Claim 57 (New): The process as claimed in Claim 29, wherein the amine is at least one secondary amine of formula HNR^4R^5 , wherein R^4 and R^5 are substituents other than hydrogen.

Claim 58 (New): The process as claimed in Claim 29, wherein the amine is at least one secondary amine of formula HNR^4R^5 , wherein R^4 and R^5 are independently a $\text{C}_1\text{-}\text{C}_{20}$ -alkyl radical which may be at least one of interrupted and substituted by at least one of N and O.

Claim 59 (New): The process as claimed in Claim 58, wherein at least one of the R^4 and R^5 groups is a $\text{C}_1\text{-}\text{C}_{20}$ -alkyl radical that is at least one of interrupted and substituted by at least one of N and O, wherein the N and O are substituted by at least one of H, a $\text{C}_1\text{-}\text{C}_6$ -alkyl group, and aryl group and a hetaryl group.

Claim 60 (New): The process as claimed in Claim 29, wherein the amine is at least one secondary amine of formula HNR^4R^5 selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine and diphenylamine.

Claim 61 (New): The additive concentrate as claimed in Claim 16, wherein the phenol of the Mannich adduct is at least one of an unsubstituted phenol or an alkyl substituted phenol.

Claim 62 (New): The additive concentrate as claimed in Claim 16, wherein the phenol of the Mannich adduct is 2-methyl phenol.

Claim 63 (New): The additive concentrate as claimed in Claim 16, wherein the amine of the Mannich adduct is at least one secondary amine of formula HNR^4R^5 , wherein R^4 and R^5 are substituents other than hydrogen.

Claim 64 (New): The additive concentrate as claimed in Claim 16, wherein the amine of the Mannich adduct is at least one secondary amine of formula HNR^4R^5 , wherein R^4 and R^5 are independently a $\text{C}_1\text{-}\text{C}_{20}$ -alkyl radical which may be at least one of interrupted and substituted by at least one of N and O.

Claim 65 (New): The additive concentrate as claimed in Claim 64, wherein at least one of the R^4 and R^5 groups is a $\text{C}_1\text{-}\text{C}_{20}$ -alkyl radical that is at least one of interrupted and

substituted by at least one of N and O, wherein the N and O are substituted by at least one of H, a C₁-C₆-alkyl group, an aryl group and a hetaryl group.

Claim 66 (New): The additive concentrate as claimed in Claim 16, wherein the amine of the Mannich adduct is at least one secondary amine of formula HNR⁴R⁵ selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine and diphenylamine.

Claim 67 (New): The fuel composition as claimed in Claim 17, wherein the phenol of the Mannich adduct is at least one of an unsubstituted phenol or an alkyl substituted phenol.

Claim 68 (New): The fuel composition as claimed in Claim 17, wherein the phenol of the Mannich adduct is 2-methyl phenol.

Claim 69 (New): The fuel composition as claimed in Claim 17, wherein the amine of the Mannich adduct is at least one secondary amine of formula HNR⁴R⁵, wherein R⁴ and R⁵ are substituents other than hydrogen.

Claim 70 (New): The fuel composition as claimed in Claim 17, wherein the amine of the Mannich adduct is at least one secondary amine of formula HNR⁴R⁵, wherein R⁴ and R⁵ are independently a C₁-C₂₀-alkyl radical which may be at least one of interrupted and substituted by at least one of N and O.

Claim 71 (New): The fuel composition as claimed in Claim 70, wherein at least one of the R⁴ and R⁵ groups is a C₁-C₂₀-alkyl radical that is at least one of interrupted and substituted by at least one of N and O, wherein the N and O are substituted by at least one of H, a C₁-C₆-alkyl group, an aryl group and a hetaryl group.

Claim 72 (New): The fuel composition as claimed in Claim 17, wherein the amine of the Mannich adduct is at least one secondary amine of formula HNR⁴R⁵ selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine and diphenylamine.

Claim 73 (New): The lubricant composition as claimed in Claim 18, wherein the phenol of the Mannich adduct is at least one of an unsubstituted phenol or an alkyl substituted phenol.

Claim 74 (New): The lubricant composition as claimed in Claim 18, wherein the phenol of the Mannich adduct is 2-methyl phenol.

Claim 75 (New): The lubricant composition as claimed in Claim 18, wherein the amine of the Mannich adduct is at least one secondary amine of formula HNR⁴R⁵, wherein R⁴ and R⁵ are substituents other than hydrogen.

Claim 76 (New): The lubricant composition as claimed in Claim 18, wherein the amine of the Mannich adduct is at least one secondary amine of formula HNR⁴R⁵, wherein R⁴

and R⁵ are independently a C₁-C₂₀-alkyl radical which may be at least one of interrupted and substituted by at least one of N and O.

Claim 77 (New): The lubricant composition as claimed in Claim 76, wherein at least one of the R⁴ and R⁵ groups is a C₁-C₂₀-alkyl radical that is at least one of interrupted and substituted by at least one of N and O, wherein the N and O are substituted by at least one of H, a C₁-C₆-alkyl group, an aryl group and a hetaryl group.

Claim 78 (New): The lubricant composition as claimed in Claim 18, wherein the amine of the Mannich adduct is at least one secondary amine of formula HNR⁴R⁵ selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine and diphenylamine.

BASIS FOR THE AMENDMENT

Claims 1-10, 12-14, and 16-78 are active in the present application. Claims 11 and 15 are canceled claims. Claims 32-78 are new claims. Support for new Claims 32-35, 44, 49-50, 55-56, 61-62, 67-68, and 73-74 is found on page 4, lines 29-31. Support for new Claims 36-43, 45-48, 51-54, 57-60, 63-66, 69-72, and 75-78 is found on page 7, lines 7-16 and on page 8, lines 1-6. No new matter is added.